

# Description and Evaluation of the Use of MIB in the ICU

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Providing care to critically-ill patients requires processing information collected from multiple sources; demands are placed on nursing time to collect this information and communicate it to many health-care providers. In addition, there is a need to accurately monitor rapid changes in patient condition and the therapy provided in response to these changes. Ultimately, there is a need to evaluate outcome of interventions in order to measure cost-effectiveness and describe quality of patient care.

The goal of the Medical Information Bus (MIB) is to communicate accurate, useful information to clinicians that will be used in decision-making. Gardner, et al, describe issues concerning the utilization of the MIB in patient care [1]. Among the most pertinent issues are the quality and validity of data stored. Technical aspects of the MIB in an ICU require consideration of several clinical and engineering interfaces that facilitate accurate data collection. For example, determining what data are stored requires filtering the data collected from the MIB; logic can be programmed to determine which values to send to a patient data file.

Each intensive care unit has the capability to collect data from 256 devices. Each patient room has the ability to store data from eight MIB devices associated to that patient; this number can be easily increased by the nurse if the patient condition requires more devices.

The MIB for infusion pumps is designed to collect flow rate and volume for each infusion. A Device Communication Controller (DCC) is already attached to the infusion pump; the DCC queries the infusion pump to detect any flow rate change and volume infused. Once a patient is admitted, the nurse can associate the MIB and data will be automatically

stored in the patient data file. This mechanism facilitates immediate data collection and therapy changes can be reported in real time.

Devices can be removed from the patient room and transported to an ancillary department such as radiology. Data collected during this period are stored in the DCC and can be retrieved when the patient returns to the room. Numerous devices can be used at one time on each patient decreasing the time needed for documentation by the nurse. Current development is focused on creating easier user interfaces for dissociating and reassociating the MIB when a patient moves to another division and devices move from patient to patient.

Being able to collect real-time data from these devices enhances the ability to evaluate their effectiveness. A pilot study is currently being conducted in a Thoracic ICU (TICU) to evaluate nursing decision-making with the use of vasoactive drugs and maintenance of blood pressure. Since the data will be automatically collected, an evaluation of this question is facilitated. A descriptive analysis will be completed; this evaluation will be utilized in the development of computerized collaborative patient care protocols in the management of post-operative cardiovascular surgery patients. The quality and validity of data collected from the MIB needs to be determined in order to provide decision support to nurses utilizing the protocols. The data from the MIB will be used to generate computerized protocol instructions. Ultimately, it is the goal of this project to complete a clinical trial of the computerized protocols and measure patient outcome.

## Reference

- [1]. Gardner, RM, et al: Ed: Medical information bus Int J of Clin Mon and Comp.6: 1989:205-9.